

# 6]Y`YZY`X`Yf\_i bXYb.'<]ghcf]gWXY'GWXÀhnY i bX'\_i`]bUf]gWXY'; YbØggY'Yf`YVYb

9bhXYW\_Y`6]Y`YZY`X.`j cb`XYf`\]ghcf]gW\Yb`5`hghUXh`ØVYf \_i`]bUf]gW\Y`; YbØggY`V]g`ni`BUhi fYf`YVb]ggYb`]a HYi hcVi f[ Yf`K U`X` XY]b`dYfZY\_hYf`Gh\XhYhf]d°

\_ca a hž'k Ybb Xi 'Ub FY]gYb ']b '8 Yi hgW\`Ub X 'XYb\_ghž'UVYf '`Ugq X]WX b]WX h'hÀi gWX Yb` 'X]YgY 'WX Ufa UbhY 'GhUXh'\ Uh'j ]Y`ni 'V]YhYb° 9]b[YVYhhYhi]a < YfnYbijcb BcfXf\Y]b!K YghZU`YbžijYfY]bh 6 | Y ` Y ZY ` X ` Y | b Y ` ZUgn | b | Y f Y b X Y ` A | g W i b [ ` U i g '; Y g W \ ] W h Y ž '? i ` | b U f ] \_ ž BUhi fi bX'BYi Ya "'A]h'gY]bYb'[YdZUghYfhYb'GhfU» Yb'i bX'[i h Yf\U`hYbYb'5`hVUi hYb'`ÀXh'X]Y'\]ghcf]gW\Y'5`hghUXh'ni a ': `Ub]YfYb Y]bžkÀ\fYbX'X]Y'I a [YVi b['XYg'HYi hcVi f[Yf'K U`XYg']XYU`Y  $A \circ [`]WX_Y]hYb ZØfCihXccf!5VYbhYiYfV]YhYh"8cWX XUg`]ghbcWX$ b]W\h'U``Yg°'8]Y'GhUXh'di `g]Yfh'Ui W\'a ]h'`YVYbX][ Yf'?i `hi f'i bX ?i bghžij cb fYbca a ]YfhYb A i gYYb V]g \]b ni Vi bhYf GhfYYh 5fh" I bX k Ybb Xi Y]b : Y]bgW\a YW\_Yf V]ghž k ]fgh Xi ']b '6]Y `Y ZY `X Ui Z  $_i$  `]bUf]gW\Y'<  $\dot{O}$ \Ydi b\_hY'ghc » Ybž\X]Y'g]W\Yf`]W\XY]bY ; YgW\ a U\ \( \frac{1}{2} \) bcgdYb'j Yfk \( \hrac{1}{2} \) bYb'k YfXYb"'5\gc'gW\ bU\``X]W\'Ub ibXaUWXX]WXVYfY]hZØfY]bYbibjYf[Ygg`]WXYbGhÀXhYhf]dbUWX 6]Y`YZY`X``\]Yf`g]bX`i bgYfY`VYghYb`H]ddg`i bX`9a dZY\`i b[Yb`ZØf XY]bYb'5i ZYbh\U`h°

# $9bhXYW_Y'X]Y'\setminus ]ghcf]gWXY'5`hghUXh'jcb$ 6]Y`YZY`X

8]Y'5`hghUXh'j cb'6]Y`YZY`X']gh'Y]b'k U\fYg'¾k Y`']b'BcfXf\Y]b!

K YghZU`Ybž'XUg'Yg'k Yfh']ghž'YbhXYW\_h'ni 'k YfXYb"'A]h']\fYb

W\Ufa UbhYb'; UggYbž'\]ghcf]gW\Yb'; YVÀi XYb'i bX'Y]bYa
i bj Yfk YW\gY`VUfYb': `U]f'\Uh'X]Y'5`hghUXh']\fYb'6Ygi W\Yfb'j]Y``ni

9]b'k Y]hYfYf'VYa Yf\_Ybgk YfhYf'C fhi]gh'XUg'F Uj YbgVYf[Yf Gd]bbYfY]ž'Y]b'VYY]bXfi  $W_Y$ bXYg']bXi ghf]Y``Yg'5bk YgYbž'XUg'U`g Y]bYg'XYf'À`hYghYb'HYI h]`i bhYfbY\a Yb'8Yi hgW\`UbXg'VY\_Ubbh']gh'' 8 Ug'; YVÀi XY'k i fXY'`]YVYj c```fYghUi f]Yfh'i bX'VY\YfVYf[h'\Yi hYY]bY'J]Y`nU\``j cb'\_i `hi fY``Yb'9]bf]W\hi b[Yb'i bX'; YgW\ÀZhYb'' < ]Yf Z]bXYh'a Ub'fY[Y`a À»]['5i gghY``i b[Ybž'?cbnYfhY'i bX'\_fYUh]j Y A Àf\_hY''8]Y'A ]gW\i b['Ui g'; YgW\]W\hY'i bX'?i bgh'a UW\h'X]YgYb C fh'VYgcbXYfg'Y]b`UXYbX''

I a 'a Y\f'ØVYf'X]Y'GhUXh[YgW\]W\hY'ni 'YfZU\fYbž'`c\bh'g]W\'Y]b 6Ygi W\']a 'GhUXha i gYi a '6]Y`YZY`X"'<]Yf'YfZU\fYb'X]Y

6Ygi WXYf'U``Yg'ØVYf'X]Y'9bhk]W\_`i b['XYf'GhUXhž'j cb']\fYb 5bZÀb[Yb'V]g'ni f'\Yi h][Yb'NY]h"'BYVYb' & Zcfa Uh]cbYb'ni f ; YgWX]WXhY'[]Vh'Yg'Ui WX']bhYfYggUbhY'5i gghY``i b[Yb'ØVYf'?i bgh i bX'?i `hi f'XYf'FY[]cb"

5V[Yfi bXYh'k]fX'Y]b'6Ygi W.']b'XYf'5`hghUXh'j cb'6]Y'YZY'X'Xi fW.
Y]bY'J]Y'nU\''j cb'\_'Y]bYb'@AXYb'i bX'6ci h]ei Ybž']b'XYbYb''c\_U'Y
DfcXi \_hY'i bX'?i bgh\UbXk Yf\_'Ub[YVchYb'k YfXYb'''<]Yf'\_Ubb'a Ub
Y]bn][Ufh][Y'Gci j Yb]fg'Z]bXYbž'X]Y'g]W.'k i bXYfVUf'ni a
J YfgWXYb\_Yb'cXYf'U'g'9f]bbYfi b['Y][bYb"

#### H]ddg ZØf XY]bYb 6Ygi W.

- D`UbYb'G]Y'[YbØ[YbX'NY]h'Y]bži a 'X]Y'j YfgWX]YXYbYb GY\Ybgk ØfX][\_Y]hYb']b'Fi\Y'ni 'Yf\_i bXYb"
- Bi hnYb'G]Y'X]Y'A Ò[`]WX\_Y]hž'Ub'Y]bYf'GhUXhZØ\fi b[hY]`ni bY\a Ybži a 'a Y\f'ØVYf'X]Y'; YgWX]WXhY'i bX; YgWX]WXhYb'XYf'5`hghUXh'ni 'YfZU\fYb"
- J Y f d U g g Y b G Y b W h X Y g U g c b U Y b A A f h Y i b X : Y g h Y ž X Y f Y [ Y a A ] [ ] a 5 h Y b A U f h g h U h Z ] b X Y b "
- HfU[Yb'G]Y'VYeiYa Y'GWi\Yž'XU'X]Y'[YdZ'UghYfhYb GhfU»Yb'nia '9f\_i bXYb'Y]b`UXYb"

6]Y`YZY`Xg`5`hghUXh`V]YhYh`Y]bY`[Y`i b[YbY`A]gWXi b[`Ui g; YgWX]WXhYž?i`hi f`i bX`@YVYbgUfh", VYfU```[]Vh`Yg`Yhk Ugʻni YbhXYW\_Ybži bX`X]Y`\Yfn`]WXY; UghZfYi bXgWXUZh`XYf 9]b\Y]a]gWXYb`aUWXh`XYb`6Ygi WX`ni `Y]bYa`i bj Yf[Ygg`]WXYb 9f`YVb]g"`KYbb`G]Y`6]Y`YZY`X`bcWX`b]WXh`VYgi WXh`\UVYbž`gc``hYbG]Y`Yg`g]WX`b]WXh`Ybh[Y\Yb``UggYbž`X]Y`\]ghcf]gWXY`5`hghUXh`ni Yf i bXYb"

# ?i`]bUf]gW $Y' < ][ \ \ ][ \ \ hg'ZØf': Y]bgWAa YW_Yf$

6]Y`YZY`X`a U[``Ui Z`XYb`YfghYb`6`]W\_`b]W\h`U`g`\_i`]bUf]gW\Yg
9d]nYbhfi a `YfgW\Y]bYbž'XcW\`X]Y`GhUXh`\Uh`k Y]h`a Y\f`ni `V]YhYbž
U`g'j ]Y`Y`XYb\_Yb"`Jcb`hfUX]h]cbY``Yb`XYi hgW\Yb`; Yf]W\hYb`V]g`\]b
ni `]bhYfbUh]cbU`Yf`?ØW\Y`n]Y\h`6]Y`YZY`X`: Y]bgW\a YW\_Yf`Ui g`bU\
i bX`ZYfb`Ub"`9[U`ž`cV`Xi `Y]b`@]YV\UVYf`j cb`[i hYa `9ggYb`V]gh

cXYf'Y]bZUW\`bif'Yhk Ug'BYiYg'dfcV]YfYb'a ÒW\hYghz'\]Yf']gh'ZØf YXYb'; YgW\a UW\_'Yhk Ug'XUVY]°

K Ybb 'Yg'i a g'A ]hhU[ YggYb'[ Y\hž'V]YhYh'6]Y`YZY`X`nU\`fY]W\Y
Cdh]cbYb"'8]Y'VYY]bXfi W\_YbXY'5i gk U\``Ub FYghUi fUbhg'fY]W\h
j cb '\_`Ugg]gW\Yf'XYi hgW\Yf'?cgh'V]g'\]b 'ni ']bbcj Uh]j Yf
]bhYfbUh]cbU`Yf'?ØW\Y"'Ni 'XYb'<][\`][\hg'nÀ\`h'XUg'FYghUi fUbh'
@ cghYf]U ž'VY\_Ubbh'ZØf'gY]bY'f]Yg][ Yb'D]nnYb'i bX
\Ui g[ Ya UW\hYb'DUghU"'9]b'k Y]hYfYf'; Y\Y]a h]dd']gh'XUg'
Gi g\]\Ui g ž'k c'Xi 'Zf]gW\Yg'Gi g\]'i bX'UbXYfY''UdUb]gW\Y
GdYn]U`]hÀhYb'[ Yb]Y»Yb'\_Ubbgh"

- FY[]cbU`Y`GdYn]U`]hÀhYb. DfcV]Yf'i bVYX]b[h'X]Y'
   6]Y`YZY`XYf'GYbZ ž'Y]bY'8Y`]\_UhYggYž'X]Y']b'j ]Y`Yb
  `c\_U`Yb'; Yf]WXhYb'j Yfk YbXYh'k ]fX"
- 8 Y Zh][Y'? ØWX Y. '6 Ygi WX Y'X Ug' Kifgh\Uig 'ZØf'hmd]gWX XYihgWX Y'K ØfghWX Yb'ib X'Ub XYfY': `Y]gWX [Yf]WX hY"
- JY[YhUf]gWXYCdh]cbYb. =a =JY[Ub/7c =Z]bXYghXi  $=nU^{Y}WXY^{-}fYUh]jY^{-}bX^{-}gWXaUW_{UZhY^{-}j}Y[YhUf]gWXY^{-}bX^{-}jY[UbY^{-};Yf]WXhY^{-}$

8 Ugʻ5VYbXYggYbʻ]bʻ6]Y`YZY`Xʻ]ghʻY]bʻ9f`YVb]gʻZØfʻg]WX"'8]YʻGhUXh V]YhYhʻY]bYʻJ]Y`nU\`ʻj cbʻFYghUi fUbhgžʻX]YʻZØfʻYXYbʻ; Y`XVYi hY` [YY][bYhʻg]bX"': ØfʻY]bʻ[Y\cVYbYgʻ8]bbYfʻYa dZ]Y\`hʻg]WXʻXUgʻ FYghUi fUbhʻ@]WX hYbghY]bYf žʻXUgʻZØfʻgY]bYʻ\_fYUh]j Y ?ca dcg]h]cbʻUi gʻbcfXXYi hgWXYbʻi bXʻa YX]hYffUbYbʻ9]bZØggYb VY\_Ubbhʻ]gh"'<]Yf`k]fXʻfY[]cbUʻYʻ? ØWXYa]hʻ\cWXkYfh][YbʻNi hUhYb i bX'Y]bYa 'a cXYfbYbʻHk]qh'ni VYfY]hYh"

 $: \emptyset f "gd UbbYbXYfY"; YgW a UW\_gYf `YVb]ggY"\_Ubbgh `Xi "XUg"$ 

JYbhf]c 'VYgi WXYb":8]YgY'HUdUg!6Uf'ØVYffUgWkh'a]h
k YWkgY`bXYb']bhYfbUh]cbU`Yb'?Ògh`]Wk\_Y]hYb'i bX'Y]bYf
i a ZUb[fY]WXYb'K Y]b\_UfhY"'→XYU`'ZØf'[YgY``][Y'5VYbXYž'V]YhYh'XUg
JYbhf]c'Y]bY'YbhgdUbbhY'5ha cgd\ÀfY'i bX'X]Y'AÒ[`]Wk\_Y]hž
j YfgWk]YXYbY'\_`Y]bY'; Yf]WkhY'ni 'dfcV]YfYb"

# A $Uf_h\U^Yb i b X : Y]b_cgh[YgWX AZhY]$

9]b'k Y]hYfYf'<Ò\Ydi b\_h'ZØf': Y]bgW\a YW\_Yf']gh'X]Y'A Uf\_h\U``Y 6]Y`YZY`X"'<]Yf'\_Ubbgh'Xi 'Zf]gW\Yž'fY[]cbU`Y'DfcXi \_hY'Z]bXYbž'j cbCVgh'i bX'; Ya ØgY'V]g'\]b'ni '?ÀgY'i bX'W\UfW'hYf]Y"'J]Y`Y'GhÀbXYV]YhYb'Ui W\'X]Y'A Ò[`]W\\_Y]hž'gdYn]Y``Y'`c\_U`Y'?Ògh`]W\\_Y]hYb'nidfcV]YfYb"'8]YgY'9fZU\fib[']gh'b]W\h'bi f'ZØf'XYb'; Ui a Ybž qcbXYfb'Ui W\'ZØf'X]Y'G]bbY'VYfY]W\YfbX°

A Uf_hghUbX	DfcXi _hUb[YVch	
CVgh7; Ya ØgY	: f]gWX i bX fY[]cbU`žX]fY_hij ca	
	9fnYi [Yf	
?ÀgY'/'Kifgh	5i gk U\`'Ub'`c_U`Yb'?ÀgYgcfhYb	
	i bX <sup>-</sup> K i fghk UfYb	
6ÀW_YfY]	<ui 6fch="" bx<="" g[="" td="" uw\hyg="" ya=""></ui>	
	; YVÀW_	

JYf[]gg'b]Wk hž']b'Y]bYa 'XYf'bYhhYb': Y]b\_cgh[YgWkÀZhY'k]Y': Y]b\_cgh'? ÀZYf 'j cfVY]ni gWk Ui Ybž'k c'Xi 'VYgcbXYfY @YW\_YfY]Yb'Ui g'XYf'FY[]cb'Z]bXYb'\_Ubbgh'' < ]Yf'Z]bXYgh'Xi 'Ui Wk Y]b'[fc» Yg'5b[YVch'Ub'\cWkkYfh][Yb'K Y]bYbž'² 'Yb'i bX; Yk ØfnYbž'X]Y'g]Wk'\Yfj cffU[YbX'ni a 'A]hbY\aYb'Y][bYb"

 $B\ UhØf`]WX\ ']gh'6]Y`YZY`X`Ui\ WX`Y]b`C\ fh'ZØf'\_i\ `]b\ Uf]gWX\ Y`9j\ Yb\ hg"$$ \mathring{A}\ f`]WX\ Y`J\ YfUb\ ghU`hi\ b[\ Yb`k\ ]Y`XUg`6]Y`YZY`XYf`GhfU»\ Yb\ ZY\ ghž`VY]$$ XYa ``c_U`Y`F\ YghUi\ fUb\ hg`i\ b\ X`@Y\ Y\ b\ ga\ ]hhY`\\Ab\ X`Yf`]\ fY$$ Gd\ Yn]U`]h\Ah\ b\ Ub\ V]Y\ h\ b\ z'g]b\ X`Y]b`A\ i\ gg`ZØf`'Y\ X\ Yb`:\ Y]b\ gWX\ a\ Y\ W_Yf"$$ 8\ cfh'_Ub\ b\ gh'Xi\ `\Yfn\ UZ\ Y';\ Yf]WX\ h\ Y\ dfc\ V]Yf\ b\ i\ b\ X`B\ Yi\ Yg\ Yb\ X\ Y\ W_Yb\ z'\ k\ A\ f\ b\ X`Xi\ `Xi\ fWX\ X]Y\ ``Y\\ UZ\ h\ Y\ b\ Ghf\ U\ Y\ b\ X\ Yf\ GhUX\ h\ gWX\ `Yb\ X\ Yfgh\"$$$ 

 $5 \ VgWX^]Y \ YbX^Aggh^g]WX^gU[Yb \ Z^X \ Ugg^6]Y^Y \ Z^Y \ X^Y]b$ 

ØVYffUgWXYbXYg'\_i `]bUf]gWXYg'DUfUX]Yg']gh"'Jcb'hfUX]h]cbY``Yb
; Yf]WXhYb'ØVYf']bhYfbUh]cbU`Y'? ØWXY'V]g'\]b'ni 'ZY]bYb
8Y`]\_UhYggYb'i bX'`YV\UZhYb'A Àf\_hYb''\]Yf']gh'ZØf'YXYb
; YgWXa UW\_'Yhk Ug'XUVY]"'D`UbY'XY]bY'\_i `]bUf]gWXY
9bhXYW\_i b[ ghci f'Xi fWX'6]Y`YZY`X'i bX'`Ugg'X]WX'j cb'XYb
j ]Y`ZÀ`h][ Yb'; YgWXa ÀW\_Yfb'XYf'GhUXh'ØVYfnYi [ Yb''

# BUhi fYf`YVb]ggY]a HYi hcVi f[YfKU`X

 $8 \ Yf'HYi hc Vi f[Yf'K U`X']gh'Y]b'k U \ fYg'DUfUX]Yg'ZØf \\ B Uhi f`]YV \ UVYf'i b X'C i h X c c f! 9 b h \ i g]Ugh Y b'' A ]h'g Y]b Y f \\ VYnUi VYfb XYb'@Ub Xg W UZh'Ui g'X]W h Y b'K À`XYfb Z'g Ub Zh Y b' < Ø[Y`b i b X'Y]b X fi \ W_gj c``Yb': Y`g Y b'[]Vh'Yg'\]Yf'nU \`fY]W X'A Õ[`]W _Y]h Y b Z X]Y'B Uhi f']b'j c``Yf'D fUW h'ni 'Yf`YVYb''$ 

8]YFY[]cb'YfghfYW\_hg]W\@VYfa Y\f'U`g'%\$\$?]`ca YhYf'i bX'V]YhYh Y]bY'J]Y`nU\`j cb'K UbXYfk Y[Ybž'X]Y'Xi fW\'a U`Yf]gW\Y'8 OfZYfž UhYa VYfUi VYbXY'5i gV`]W\_Y'i bX'\]ghcf]gW\Y'GhÀhhYb'ZØ\fYb"'9]bYg XYf'VY`]YVhYghYb'K UbXYfn]Y`Y']gh'XYf'< Yfa Ubbgk Y[ž'Y]b' cZZ]n]Y``Yf'K UbXYfk Y[ž'XYf'Xi fW\'XYb'[UbnYb'HYi hcVi f[Yf K U`X'j Yf`Ài Zh'i bX'a ]h'gY]bYb'%) \*'?]`ca YhYfb'gdY\_hU\_i `ÀfY 5i gV`]W\_Y'i bX'VYY]bXfi W\_YbXY'BUhi fYf`YVb]ggY'V]YhYh'

 $< ]Yf "g]bX"Y]b][ Y"XYf"VYghYb"5\_h]j ]hÀhYbž"X]Y"Xi "]a "HYi hcVi f[ YfK U"X"[ Yb]Y" Yb"_Ubbgh$ 

- K UbXYfi b[Yb.'9[U`ž'cV'Xi 'Y]bYb'YbhgdUbbhYb GdUn]Yf[Ub['cXYf'Y]bY'\YfUi gZcfXYfbXY'K UbXYfi b[ gi W\ghž'\]Yf'Z]bXYgh'Xi 'ZØf'YXYg': ]hbYgg`Yj Y`'Yhk Ug"
- FUXZU\fYb. 8Yf HYi hcVi f[Yf K U`X'j YfZØ[h'ØVYf'j]Y`Y FUXkY[YžX]Y Yg X]f Yfa Ò[`]W Ybž X]Y FY[]cb Ui Z'nkY] FÀXYfb ni Yf\_i bXYb"
- ; YcWUW ]b[. K Ybb Xi Y]b V]ggW Yb 5VYbhYi Yf a U[ghž XUbb dfcV]YfY; YcWUW ]b[ Ui g Y]bY a cXYfbY GW Uhngi W YžX]Y ØVYfU ]a : Yi YfghY]b [YXY]\h"
- D]W\_b]W\_Yb. '8]Y 'nU\`fY]W\Yb 'fi\][Yb '@]W\hi b[Yb 'i bX 5i gg]W\hgdi b\_hY '`UXYb 'XUni 'Y]bž'X]Y 'GYY`Y 'VUi a Y`b 'ni `UggYb 'i bX 'Y]b 'D]W\_b]W\_'a ]h '6`]W\_'Ui Z'X]Y '@UbXgW\UZh'ni

9]bY'VYa Yf\_Ybgk YfhY'GY\Ybgk ØfX][\_Y]h']a 'HYi hcVi f[Yf'K U'X']gh XUg'< Yfa UbbgXYb\_a U'"8]YgYg'VYY]bXfi W\_YbXY'8Yb\_a U'ž'XUg %, +) 'Y]b[Yk Y]\h'k i fXYž'ghY\h'Ui Z'XYa '; fchYbVi f[!<Ø[Y''i bX Yf]bbYfh'Ub'X]Y'GW\'UW\h']a 'HYi hcVi f[Yf'K U'Xž'VY]'XYf'X]Y ; Yfa UbYb'i bhYf'5fa ]b]i g']a '\\]\f'- 'b"'7\f"X]Y'fÒa ]gW\Yb @Y[]cbYb'VYg]Y[hYb"'Jcb'\]Yf'Ui g'\Ugh'Xi 'Y]bYb'\Yff']W\Yb'6`]W\_ ØVYf'XUg'@UbXž'i bX'Yg'[]Vh'nU\`fY]W\Y'K UbXYfk Y[Yž'X]Y'ni 'XYa 8Yb\_a U`'ZØ\fYb"

9]b'k Y]hYfYg'<][\`][\h']gh'XUg'6Yk U`XYhY'B Uhi fgWki hn[YV]Yh
]a 'HYi hcVi f[Yf'K U`Xž'XUg'Y]bY'J]Y`nU\`'j cb': `cfU'i bX': Ui bU
VY\YfVYf[h''<]Yf'\_Ubbgh'Xi 'b]Wkh'bi f'k UbXYfb'i bX'X]Y'BUhi f
[Yb]Y»Ybž'gcbXYfb'Ui Wk'H]YfY'k]Y'FY\Yž': ØWkgY'i bX'Y]bY
J]Y`nU\`'j cb'Jc[Y`UfhYb'VYcVUWkhYb"

K Ybb`Xi 'a ]h`XYf`: Ua ]`]Y`ni gW\Ui Yb`a ÒW\hYghž`]gh`XYf`
K U`Xgd]Y`d`Uhn`Y]b`hc``Yf`5b`Ui Zdi b\_h"'9f`Yfa Ò[`]W\h'?]bXYfbž`]b
XYf`BUhi f`U\_h]j 'ni 'gY]bž'k À\fYbX`g]W\`X]Y`9`hYfb`YbhgdUbbYb`i bX
X]Y`@UbXgW\UZh`[Yb]Y»Yb`\_ÒbbYb"

: Øf'Y]bYb'VYgcbXYfg'gW\ÒbYb'5i gV`]W\_'Ya dZ]Y\`h'g]W\'Y]b'6Ygi W\
Ui Z'XYa 'GhUdY`ZY`XYf'6Yf[ ž'k c'g]W\'Y]bY'5i gg]W\hgd`UhhZcfa
VYZ]bXYh"'8Yf'6`]W\_'j cb'\]Yf']gh'VYgcbXYfg'VY]'GcbbYbi bhYf[ Ub[
gdY\_hU\_i `Àf'i bX'n]Y\h: chc[ fUZ]Y!9bh\i g]UghYb'a U[ ]gW\'Ub"

JYf[]gg'b]W\hz'XY]bY'K UbXYfgW\i\Y'Y]bni dUW\_Yb'i bX'XY]bY
?Ua YfU'a ]hni bY\a Ybz'k Ybb'Xi 'X]Y'GW\Òb\Y]h'XYg'HYi hcVi f[Yf
K U`XYg'YbhXYW\_gh"'9[U`z'cV'Xi 'X]Y'Fi\Y'XYf'BUhi f'gi W\gh'cXYf
U\_h]j 'k YfXYb'a ÒW\hYghz'X]YgY'FY[]cb'\Uh'ZØf'YXYb'Yhk Ug'ni
V]YhYb"'D`UbY'XY]bY'FY]gY'i bX'`Ugg'X]W\j cb'XYb'Y]bn][Ufh][Yb
9f`YVb]ggYb'XYg'HYi hcVi f[Yf'K U`XYg'j YfnUi VYfb"

# ?i`hif'i bX'?i bghgnYbY.'Jcb'A i gYYb'V]g'ni GhfYYh'5fh

Y]b``YVYbX][Yf`Cfhž`Ub`XYa '?i`hif`ibX`?ibgh`]b`j]Y`Yb`:cfaYb Yf`YVVUf`g]bX"'Jcb`fYbcaa]YfhYb`AigYYb`ØVYf``YVYbX][Y ;U`Yf]Yb`V]g`\]b`ni`VYY]bXfiW\_YbXYf`GhfYYh`5fh``X]Y`?i`hif!`ibX ?ibghgnYbY`]b`6]Y`YZY`X`V]YhYh`ZØf`YXYb; YgWXaUW\_Yhk Ug"

9]bY'XYf'YfghYb'GhUh]cbYb'ZØf'?ibgh`]YV\UVYf']gh'XUg
?ibghaigYia'6]Y`YZY`Xž'XUg'g]W\'XifW\'gY]bY'acXYfbY
5fW\]hY\_hif'\Yfjcf\YVh'ibX'Y]bY'Y]bXfiW\_gjc``Y'GUaa`ib[
nY]h[YbÒgg]gW\Yf'?ibgh'nY][h''6YgcbXYfg'\Yfjcfni\YVYb'g]bX'X]Y
K Yf\_Y'jcb'?Øbgh`Yfb'k]Y'AUI'6YW\_aUbb'ibX'¾Ub'8iViZZYh''8]Y
K YW\gY`UigghY``ib[Yb'gck]Y'X]Y'j]Y`ZÀ`h][Yb'JYfUbghU`hib[Yb
aUW\Yb'XUg'AigYia'ni'Y]bYa'\_i`hifY``Yb'<chgdch'XYf'GhUXh''
5i > YfXYa'V]YhYh'XUg'AigYia'cZh': Ø\fib[Yb'ibX'Kcf\_g\cdg'Ubž
X]Y'h]YZYf']b'X]Y'AUhYf]Y'Y]bZØ\fYb''

9]b 'k Y]hYfYg' < ][ \`][ \h']gh'XUg' < ]ghcf]gWXY'A i gYi a '6]Y`YZY`XŽ'XUg XYb '6Ygi WXYfb 'X]Y 'A  $O[`]WX_Y]h'[]Vhž']b 'X]Y'; YgWX]WX hY 'XYf'GhUXh Y]bni hUi WXYb'' < ]Yf'k YfXYb 'nU\`fY]WXY'5fhYZU_hY'Ui g j YfgWX]YXYbYb'9dcWXYb'[ YnY][ h'i bX'X]Y'9bhk ]W_`i b[ 'XYf'GhUXh V]g']b 'X]Y'; Y[ Ybk Ufh'Yf_`Àfh''8]Y']bhYfU_h]j Yb 5i gghY``i b[ gY`Ya YbhY'`UXYb'XUni 'Y]bž'X]Y'; YgWX]WXhY'Ui Z qdUbbYbXY'K Y]gY'ni 'YbhXYW_Yb''$ 

8]Y; U`Yf]Y`]b`XYf`Jc`\_g\cW\gW\i`Y`6]Y`YZY`X`]gh`Y]b`kY]hYfYfk |W\h][Yf`Cfh`ZØf`?ibgh]bhYfYgg]YfhY"`G]Y`VY\YfVYf[h`fY[Y`a\andana][kYW\gY`bXY`5igghY``ib[Yb'jcb`fY[]cbU`Yb`?Øbgh`Yfb`ibX`V]YhYhXUa]h`Y]bY`D`UhhZcfa`ZØf``c\_U`Y`HU`YbhYž`]\fY`KYf\_Y`Y]bYaVfY]hYfYb`DiV`]\_ia`ni`df\agYbh]YfYb"`8]YgY`;U`Yf]Y`]gh`Y]b`6YkY]gXUZØfž`k]Y`ghUf\_`X]Y`?ibghgnYbY`jcb`XYf`;YaY]bgW\UZh`[Ydf\alana[h]gh"

I bX :XUbb [ ]Vh'Yg'bcW\ :X]Y :? i bghgnYbY :]a : OZZYbh ]W\ Yb :F Ui a ":8]Y GhfU\( \*Yb : Yb : j cb :6]Y \( `YZY \) X :g]bX :a ]h'VYY]bXfi \( W\_YbXYb : K \) UbXa \( U \) YfY]Yb i bX :; \( fUZ]hh] [ \( YgW\\ a \\ \ØW\_h\( E'X) Y :c Zh :]b :\ Ni \( gUa \) a \( YbUfVY )h :a ]h'\c\_U\Yb :\ ?\ \Øbgh\( Yb : '6YgcbXYfg :]b :\ GhUXhhY]\Yb :\ k ]Y :? YfbghUXh \\ cXYf'GW\\ ]\`XYgW\\ Y'\_Ubb :\ a \Ub :\ X]Y :\_fYUh]j \( Y : '9bYf[ ]Y :\ XYf'GhUXh \\ Ui \\ hbU\ :\ Yf\YVYb ":< ]Yf'g]bX :\ Y]b][ \( Y :\ VYa \\ Yf\_Ybgk \\ YfhY :\ C \( fhY\( E'X) Y :\ Xi \\ b ]\W\\ h'j \\ Yfd UggYb :\ gc \``hYgh.

- K UbXa U`YfY]`]a 'G]Y[Zf]YXd`Uhn. '9]b '`c\_U`Yg
   ?i bghk Yf\_ž'XUg'X]Y 'GhUXh[YgWX]WXhY 'Ui Z'Y]bY '`YVYbX][Y
   5fh'i bX'K Y]gY'XUfghY``h"
- GhfYYh'5fh'Hcif.'J]Y`Y'5bV]YhYf'cZZYf]YfYb'[YZØ\fhY HcifYbž'VY]'XYbYb'Xi'X]Y'VYghYb'; fUZZ]h]g'ibX K UbXa U`YfY]Yb'XYf'GhUXh'\_YbbYb`YfbYb'\_Ubbgh"
- ?i bgh']a 'ÒZZYbh`]WX Yb 'F Ui a . '≢bghU``Uh]cbYb'i bX G\_i `dhi fYbž'X]Y'ØVYfU``']b'XYf'GhUXh'ni 'Z]bXYb'g]bXž'`UXYb ni a '9bhXYW\_Yb'Y]b"

8]Y'6]Y`YZY`XYf`D\]`\Ufacb]\_Yf`g]bX`Y]bY`kY]hYfY`\_i`hifY``Y

\$\delta gh]hih]cb\delta X]Y'b]W\h'Uig`XYf`?i`hifgnYbY`XYf`GhUXh`kY[niXYb\_Yb]gh"`G]Y`V]YhYb`Y]b'j]Y`Z\delta h][Yg`FYdYfhc]fY'jcb`\_`Ugg]gW\Yb?cbnYfhYb`V]g`\]b'ni`acXYfbYb`5i\ZZ\delta\\fib[Yb"`8Ug`6]Y`YZY`XYf\GhUXhh\YUhYf`]gh'YVYb\ZU``g`Y]b`VYXYihYbXYf`Cfh'\Z\delta f`XUfghY``YbXY?ibgh'ibX`V]YhYhY]bY`VfY]hY`DU`YhhY`Ub`H\YUhYfUi\ZZ\delta\\fib[Yb\delta\CdYfb'ibX`6U``Yhh"

 $: \varnothing f ``U``Y\check{z}`X]Y ``g]WX ``Z\varnothing f `X]Y ``@]hYfUhi f ``]bhYfYgg]YfYb\check{z}`]gh`X]Y \\ GhUXhV]V`]ch\Y_``6]Y`YZY`X`Y]bYb``6Ygi WX`k Yfh''`<]Yf`Z]bXYgh`Xib]WXh`bi f `Y]bY`f]Yg][Y`5i gk U\``Ub``6\ØWXYfb\z`gcbXYfb``Ui WXfY[Y`a\A\)][Y`@Ygi b[Yb`i bX``]hYfUf]gWXY`9j Ybhg''`8]Y``6]V`]ch\Y_Zb[]Yfh`U`g`_i `hi fY``Yg`NYbhfi a`i bX`]gh`Y]b`HfYZZdi b_h`Z\Øf@]hYfUhi fZfYi bXY`i bX`5i hcfYb''$ 

9]b'k]W\h][Yg'9jYbh']a '\_i `hi fY``Yb'?U`YbXYf'j cb'6]Y`YZY`X']gh'X]Y
BUW\h'XYf'A i gYYbž'X]Y'YXYg'\J\f'?i bgh'i bX'?i `hi f]bhYfYgg]YfhY
Ubn]Y\h''5b'X]YgYa '5VYbX'ÒZZbYb'nU\`fY]W\Y'A i gYYb'i bX
; U`Yf]Yb']\fY'HØfYb'i bX'V]YhYb'\_cghYb`cgY': Ø\fi b[Ybž
K cf\_g\cdg'i bX'JYfUbghU`hi b[Yb'Ub"'8]Yg']gh'Y]bY'\Yfj cffU[YbXY; Y`Y[Yb\Y]hž'X]Y'\_i `hi fY``Yb'GW\AhnY'XYf'GhUXh'ni 'Yf\_i bXYb"

 $< ]Yf^{\cdot}]gh^{\cdot}Y]bY^{\cdot}, \ VYfg]WAh^{\cdot} \emptyset VYf^{\cdot}Y]b][\ Y^{\cdot}XYf^{\cdot}k \ ]WAh][\ ghYb^{\cdot}]b^{\cdot}G]Y^{\cdot}YZY^{\cdot}X.$ 

9]bf]WXhi b[	5fh	5 X f Y g g Y
?ibghaigYia	AcXYfbY'?ibgh	Hf]ddY`ghfU»Y'&%ž
6]Y`Y <i>Z</i> Y`X		' ' * %)

9]bf]WX hi b[	5fh	5 X f Y g g Y
<pre>&lt; ]ghc f]gWX Y g</pre>	GhUXh[YgWX]WXhY	5`hghÀXhYf
AigYia		?]fWkghfU»Y^&ž
		' ' * \$& <sup>:</sup> 6]Y`Y <i>Z</i> Y`X
6]Y`Y <i>Z</i> Y`XYf	H\YUhYfž <sup>*</sup> CdYf	FUh\Uigd`Uhn'%ž
GhUXhh\YUhYf		' ' * \$& <sup>:</sup> 6]Y`Y <i>Z</i> Y`X
GhUXhV]V`]ch\Y_	@hYfUhi fž	FcgYbghfU» Yʻ%ž
6]Y`YZY`X	JYfUbghU`hi b[Yb	' ' * \$& 6]Y`Y <i>Z</i> Y`X

8]Y?ibghlibX?i`hifgnYbY`]b`6]Y`YZY`X`]gh'XmbUa]gW\ibX
j]Y`ZÀ`h]["'CV'Xi 'Y]b`: Ub'j cb'\_`Ugg]gW\Yf'?ibghž'H\YUhYf'cXYf
nY]h[YbÒgg]gW\Yf'GhfYYh'5fh'V]ghž'Yg`[]Vh']aaYf'Yhk Ug'BYiYg'ni
YbhXYW\_Yb"'JYfdUggY'b]W\h'X]Y'; Y`Y[Yb\Y]hž'X]YgY'`YVYbX][Y
?i`hif'ni 'Yf`YVYbž'kÀ\fYbX'Xi 'X]Y'GhUXh'Yf\_ibXYgh''KY]hYfY
&DZcfaUh]cbYb'ni '\_i`hifY``Yb'JYfUbghU`hib[Yb'ibX'5b[YVchYbZ]bXYgh'Xi 'UiZ'XYf'cZZ]n]Y``Yb'KYVgY]hY'XYf'GhUXh'6]Y`YZY`X"

# J YfUbghU`hi b[Yb'i bX': YghYž'X]Y'Xi 'b]W\h j YfdUggYb'gc``hYgh

6]Y`YZY`X`V]YhYh`Y]bY`J]Y`nU\``j cb`JYfUbghU`hi b[Yb`i bX`: YghYbž X]Y`XUg`\_i `hi fY``Y`@YVYb`XYf`GhUXh`dfÀ[Yb`i bX`6Ygi W\Yf`Ui g`bU\ i bX`ZYfb`Ubn]Y\Yb"`<]Yf`Yfk UfhYb`X]W\`Yf`YVb]gfY]W\Y`HU[Y`j c``Yf A i g]\_ž?i bghž?i`]bUf]\_`i bX`; YgY``][\_Y]h"`GW\Ui `X]f`Y]b][Y`XYf <][\`][\bg`Ubž`X]Y`Xi `VY]`XY]bYa `6Ygi W\`]b`6]Y`YZY`X`Ui Z`\_Y]bYb : U```j YfdUggYb`gc``hYgh°

## $%"6]Y`YZY`XYfKY]\bUW\hga\Uf_h$

- @YW\_YfY]Yb'k]Y'; `Ø\kY]bž'[YVfUbbhY'A UbXY`b'i bX Ghc``Yb"
- < UbX[YZYfh][hY; YgWXYb\_Y'jcb``c\_U`Yb'?Øbgh`Yfb'ibX

- < UbXk Yf Yfb"
- 9]b'UVk YWkg`i b[gfY]WkYg'6 $\varnothing$ \bYbdfc[fUa a 'a ]h'@j Y! A i q]\_'i bX'5i Zhf]hhYb"

8Yf'A Uf\_h'VY[]bbh']b'XYf'FY[Y`'9bXY'BcjYa VYf'i bX'XUi Yfh'V]g j cf'<Y]`][UVYbX"

## &" 6]Y`YZY`Xg`GdUffYbVi f[ ZYgh

8 UgʻGdUffYbVi f[ ZYghʻ]ghʻY]bʻGdY\_hU\_YʻžʻXUgʻYXYgʻ\*J\fʻ]a Gca a YfʻghUhhZ]bXYhʻi bXʻ6Ygi W\Yfʻ]bʻX]YʻNY]hʻXYfʻF]hhYfʻi bX 6i f[ YbʻYbhZØ\fh"8]Yʻ: Yghi b[ 'GdUffYbVi f[ žʻY]bYgʻXYf K U\fnY]W\Ybʻ6]Y`YZY`Xgžʻk]fX'ni a 'GW\Ui d`Uhn'j cb.

- < ]ghcf]gWXYb^A Àf\_hYb^a ]h'< UbXk Yf\_Yfb'i bX'; Ui \_`Yfb"
- ?bUddYf\_Àa dZYb'i bX'j YfgWX]YXYbYb'F]hhYfgd]Y`Yb"
- @j Y!A i g]\_'i bX'HUbnUi ZZØ\fi b[Yb'Ui Z'a Y\fYfYb'6Ø\bYb"

9]b'<][\`][\h'g]bX'X]Y'VYY]bXfi  $\underline{W}$ YbXYb': Yi Yfk Yf\_g\ck gž'X]Y XYb'<]a a Y`'ØVYf'6]Y`YZY`X'Yf`Yi W\hYb°

# ' "'6]Y`YZY`X`CdYb'5]f': Ygh]j U`

: Øf'A i g]\_`]YV\UVYf']gh'XUg'6]Y`YZY`X'CdYb'5]f': Ygh]j U`'Y]b'A i gg" 8]YgYg': Ygh'j YfgUa a Y`h'fY[Y`a À»]['bUh]cbU`Y'i bX']bhYfbUh]cbU`Y 6UbXg'U``Yf'; YbfYgž'j cb'FcW\_'ØVYf'Dcd'V]g'\]b'ni '♣X]Y'i bX 9`Y\_hfc"'<]Yf'\_Ubbgh'Xi.

- ?cbnYfhY'i bhYf'ZfY]Ya '< ]a a Y`'[Yb]Y»Yb"
- @YW\_YfY'GdY]gYb'j cb'j YfgWX]YXYbYb': ccXhfi W\_g dfcV]YfYb"
- 8]Y'YbhgdUbbhY': Ygh]j U`Uha cgd\ÀfY']a 'GhUXhdUf\_ Yf`YVYb"

8 Ugʻ: Ygh]j UʻZ]bXYhʻ]bʻXYfʻFY[Yʻ]a ʻGdÀhgca a YfʻghUhhʻi bXʻn]Y\h Y]bʻʻl b[YgžʻVY[Y]ghYfhYgʻDi V`]\_i a ʻUb"

#### ("6]Y`YZY`XYf?ibgh!ibX?i`hifZYgh

A ]h'XYa '?i bgh!'i bX'?i `hi fZYgh'\Uh'6]Y`YZY`X'Y]bY'J YfUbghU`hi b[ YgWX UZZYbž'X]Y'?i bgh'i bX'?i `hi f'Ui Z'j YfgWX]YXYbghY'K Y]gY ZY]Yfh"'<]Yf'ghY\Yb'X]Y'\_fYUh]j Yb'? ÒdZY'XYf'GhUXh']a ': c\_i g" 6Yqi WXYf'\_ÒbbYb'q]WX'ZfYi Yb'Ui Z

- JYfgWX]YXYbY'5igghY``ib[Yb']b'; U`Yf]Yb'ibX'AigYYb"
- ?i bgh]bghU``Uh]cbYb']b'XYf'GhUXh'i bX']a': fY]Yb"
- K cf\_g\cdg'i bX'A ]ha UW\U\_h]cbYb'ZØf'≯b['i bX'5`h"

8]YgYg': Ygh'Z]bXYh'bcfa U`Yfk Y]gY']a ': fØ\`]b[ 'ghUhh'i bX'V]YhYh'Y]b hc``Yg'Dfc[ fUa a 'ZØf'U``Yž'X]Y'g]W\'ZØf'?i bgh']bhYfYgg]YfYb"

## ) " 'GYb Z!: Ygh]j U`

- 9]bY'Vi bhY'J]Y`ZU`h'Ub'GYbZgcfhYb'jYf\_cghYb"
- < UbXk Yf\_`]W\Y'GYbZ\YfghY``Yf'\_YbbYb`YfbYb"
- @j Y!?cWkg\ck g'Yf`YVYbž']b'XYbYb'GYbZ'\_fYUh]j Y
   J Yfk YbXi b['Z]bXYh"

9]b YWX hYg A i gh!GYY ZØf U``Y ; Ybi gga YbgWX Yb  $^\circ$ 

## ? i `hi fY``Y < ][ \ `][ \ hg ]a @Ui ZY $XYg > U \setminus fYg$

 $BYVYb^*XYb^*[YbUbbhYb^*: Ygh]j U^*g^*[]Vh^*Yg^*]b^*6]Y^*YZY^*X^*Ui W nU^*fY]WXY^_i ^hi fY^*Y^*J YfUbghU^hi b[Ybž^*X]Y^*fY[Y^a Å^][ghUhhZ]bXYb^*8Uni ^nÅ\^Yb.$ 

JYfUbghU`hi b[	AcbUh	6YgWkfY]Vib[
6]Y`YZY`XYf	A U]	9]b : Ygh]j U`ž'XUg'X]Y
H\YUhYfZYgh		J]Y`ZU`h'XYf
		6]Y`Y <i>Z</i> Y`XYf
		$H\YUhYfgnYbY^ZY]Yfh"$
: ]`a ZYgh'6]Y`YZY`X	$C_hcVYf$	9]b°Cfh°ZØf
		:]`a`]YV\UVYfžia

JYfUbghU`hi b[	AcbUh	6YgWkfY]Vib[
		]bbcj Uh]j Yii bX
		i bUV\Àb[ ][ Y : ]`a Y
		ni 'gY\Yb"
*Jnnb UW\ h	Bcj Ya VYf	9]bY`BUW\h'jc``Yf
		′Unnm′? `Àb[Y'i bX
		gdcbhUbYf^@jjY!
		DYfZcfa UbWYg"

9[U`žni k Y`WkYf'\*J\fYgnY]h'Xi bUWk'6]Y`YZY`X`\_ca a ghž'Yg`[]Vh]a a Yf'Yhk Ugʻni 'Yf`YVYb"'8]Y 'GhUXh']gh``YVYbX][ 'i bX'j c``Yf6Y[Y]ghYfi b[ ' 'U`gc'\U`hY'5i ggWkUi bUWk'X]YgYbJYfUbghU`hi b[Yb'i bX'`Ugg'X]Wk'j cb'6]Y`YZY`Xg'?i `hi f'i bX; Ya Y]bgWkUZhg[Y]gh'a ]hfY]» Yb°

: Øf`a Y\f`±bZcfa Uh]cbYb`ØVYf`U\_hi Y``Y`JYfUbghU`hi b[Yb`]b 6]Y`YZY`X`VYgi W\Y`X]Y`cZZ]n]Y``Y`K YVg]hY. '6]Y`YZY`X"XY"`

# H]ddg'ZØf'Y]bYb'[Y`i b[YbYb'GhÀXhYhf]d'bUWX 6]Y`YZY`X

 $6]Y`YZY`X\check{z}Y]bY`GhUXh'j c``Yf'ØVYffUgWXYbXYf': UWYhhYbž'V]YhYh'Y]bY J]Y`nU\``j cb'9f`YVb]ggYbž'X]Y' = AfYb'GhÀXhYhf]d'i bj Yf[Ygg`]WX a UWXYb''I a 'g]WXYfni ghY``Ybž'XUgg'G]Y'XUg'6YghY'Ui g' = AfYa 6Ygi WX'\YfUi g\c`Ybž'\UVYb'k]f'Y]b][Y'bØhn`]WXY'H]ddg'ZØf'G]Y ni gUa a Yb[YghY``h''$ 

## 8]Y'VYghY'FY]gYnY]h

 $8 ]Y`]XYU`Y`NY]h`ZØf`Y]bYb`6Ygi WX`]b`6]Y`YZY`X``]Y[h`]a :: fØ\`]b[fbdf]``V]g`$\delta bX`]a :< YfVgh`fGYdhYa VYf`V]g`C_hcVYfŁ"`Ni X]YgYb`$J\fYgnY]hYb`]gh`XUg`K YhhYf`a ]`X`i bX`Ub[YbY\a ž`]XYU``ZØf GhUXhVYg]WXh][i b[Yb`i bX`Ci hXccf!5_h]j ]hÀhYb"`5i » YfXYa `Z]bXYb j ]Y`Y``c_U`Y`: YghY`]b`X]YgYb`A cbUhYb`ghUhhž`k Ug`$\delta fYf`FY]gY`Y]bY ni gÀhn`]WXY`8]a Ybg]cb`j Yf`Y]\h"$ 

## : cfhVYk Y[i b[ ]b XYf GhUXh

6]Y`YZY`X`j YfZØ[h'ØVYf`Y]b`[ih'Uig[YVUihYg'ÒZZYbh`]W\Yg  $J Yf_Y \setminus fgbYhn\check{z}'XUg'Yg' = bYb'Yfa \ \mathring{o}[`]W\h\check{z}'X]Y'GhUXh'dfcV`Ya `cg'ni Yf_i bXYb''8]Y`k]W\h][ghYb': cfhVYk Y[ib[ga]hhY``g]bX.$ 

- 6i ggY. '8]Y '6i g`]b]Yb 'XYW\_Yb 'gck c\` 'XUg 'GhUXhnYbhfi a U`g 'Ui W\ 'X]Y '5i » Yb VYn]f\_Y 'UV"
- 6]Y`YZY`X'GhUXhVU\b.'9]bY'VYeiYaY'AÒ[`]WX\_Y]hž [fÒ»YfY'9bhZYfbib[Yb'nifØW\_ni`Y[Yb"
- : U\ffUXj Yf`Y]\. `\dagger j ]Y`Yb`HY]`Yb`XYf`GhUXh`[ ]Vh`Yg
  : U\ffUXghUh]cbYbž'X]Y`\dagger bYb`Yf`Ui VYbž'X]Y`I a [ YVi b[ ZYI ]VY`ni `Yf\_i bXYb"
- Ni :: i » . '8 Ug 'GhUXhnYbhfi a ']gh'\_ca dU\_h'i bX '`Àggh'g]W\
   \Yfj cffU[YbX'ni :: i » 'Yf\_i bXYb"

#### $I bhYf_\emptysetbZhYZ\emptysetf^YXYg^6iX[Yh]$

 $6]Y`YZY`X`V]YhYh`Y]bY`VfY]hY`DU`YhhY`Ub \\ VYfbUWXhi b[ga Õ[`]WX_Y]hYb"`9[U`ž`cV`G]Y`Y]b``ilif]ÕgYg`< chY`cXYf`Y]bY`[Ya Øh`]WXY`DYbg]cb`VYj cfni [Ybž`\]Yf`Z]bXYb`G]Y`X]Y dUggYbXY`I bhYf_i bZh.$ 

l bhYf_i bZhghmd	6Y]gd]Y`	DfY]g_`UggY
@lig' <chy`< td=""><td>&lt; c hY ` '6 ]Y `Y ZY `X Y f ' &lt; c Z</td><td></td></chy`<>	< c hY ` '6 ]Y `Y ZY `X Y f ' < c Z	
A ]hhY`_`UggY' <chy`< td=""><td>DUf_' ⇒bb'Vm'FUX]ggcb</td><td></td></chy`<>	DUf_' ⇒bb'Vm'FUX]ggcb	
< c ghY`	< c ghY ` '6 ]Y `Y ZY `X	
: Yf]Ybk c\bi b[	5]fVbV	J Uf]UVY`

#### $@c_U^Y^GdYn]U^]hAhYb^dfcV]YfYb$

9]b'6Ygi W\']b'6]Y`YZY`X'k ÀfY'b]W\h'j c``ghÀbX]['c\bY'X]Y \_i`]bUf]gW\Yb'<][\`][\hg'XYf'GhUXh'ni 'dfcV]YfYb"'<]Yf'g]bX'Y]b][Y `c\_U`Y'GdYn]U`]hÀhYbž'X]Y'G]Y'i bVYX]b[h'\_cghYb'gc``hYb.

- 6]Y`YZY`XYf`GYbZ.'9]b`i bj Yfk YWXgY`VUfYf`GYbZž'XYf`]b i ]Y`Yb'; Yf]WXhYb'JYfk YbXi b['Z]bXYh"
- GdUf[Y`[Yf]WXhY.'6YgcbXYfg']a ': fØ\`]b['g]bX'X]Y GdUf[Y`[Yf]WXhY'Y]b'Aigg"
- K YghZÀ`]gWXY'Di a dYfb]W\_Y`.'9]b'Xi b\_`Yg'6fchž'XUg'g]WX

#### JYfVcf[YbY'GWXAhnY'YbhXYW\_Yb

- 8]Y'GdUffYbVi f[.'8]YgY'\]ghcf]gW\Y'6i f['V]YhYh'b]W\h
  bi f'Y]bYb'9]bV\]W\_']b'X]Y'GhUXh[YgW\]W\hYž'gcbXYfb'Ui W\
  Y]bYb'UhYa VYfUi VYbXYb'6\]W\_'ØVYf'6]Y\YZY\X"
- 8cfbVYf[..'9]b'fi\][Yf'GhUXhhY]``a]h'j]Y`Yb'K UbXYf!'ibX FUXkY[Ybž']XYU``ZØf'BUhif`]YV\UVYf"
- 8 Ug'?i bgha i gYi a .'BYVYb'VYY]bXfi W\_YbXYb
   5i gghY``i b[Yb'V]YhYh'Yg'Ui WX'fY[Y`a À»]['K cf\_g\cdg'i bX
   J YfUbghU`hi b[Yb'Ub"

#### JYfUbghU`hi b[YbibXBUW\h`YVYb

 $6]Y`YZY`X`\ Uh`Ui\ W.\ Y]b`UVk\ YW.\ g`i\ b[\ gfY]W.\ Yg`B\ UW.\ h`YVYb`ni V]YhYb"'J\ cb`[\ Ya\ \varnothing h`]W.\ Yb`?\ bY]dYb`V]g`\]b`ni `di `g]YfYbXYb`7`i\ Vg Z]bXYb`G]Y`Z\ Z\ f`YXYb`;\ YgW.\ a\ UW_`Yhk\ Ug"'<U`hYb`G]Y`5i\ ggW.\ Ui\ bUW.\ J\ YfUbghU`hi\ b[\ Ybž`X]Y`k\ A\ fYbX`\=\ fYg`5i\ ZYbh\\U`hg\ ghUhhZ]bXYb"'9]b][\ Y`H]ddg`Z\ Z\ f`Y]bYb`[\ Y`i\ b[\ YbYb`5VYbX.$ 

- 6 Y gi W Y b 'G ] Y 'Y ] b '? c b n Y f h. 'J ] Y `Y '`c \_U `Y '? Ø b g h `Y f 'h f Y h Y b ] b '\_`Y ] b Y b 'J Y b i Y g 'U i Zž'X ] Y 'Y ] b Y 'd Y f g O b `] W Y '5 ha c g d \ À f Y V ] Y h Y b "
- : Y]Yfb'G]Y'Ui Z'`c\_U`Yb': Ygh]j U`g.'9j Ybhg'k]Y'XUg 6]Y`YZY`XYf'6f@W\_YbZYgh'cXYf'XUg'GhUXhZYgh'n]Y\Yb nU\`fY]WXY'6Ygi WXYf'Ub"
- @YfbYb'G]Y'`c\_U`Y'6]YfY. 'DfcV]YfYb'G]Y'X]Y
  j YfgWX]YXYbYb'GcfhYb'j cb'6]Y`YZY`XYf'6fUi YfY]Yb']b
  Y]bYa 'XYf'j ]Y`Yb'6]Yf[ ÀfhYb"

FY]gYj cfVYfY]hi b[ 'i bX 'bØhn`]WXY '5ddg

I a ' $\Rightarrow$  fY 'FY]gY 'bUW' '6]Y 'YZY 'X 'ni 'cdh]a ]Y fY b ž 'gc ''hY b 'G]Y 'Y]b][ Y 5 d dg 'Ui Z'  $\Rightarrow$  fY a '< Ub X m']bghU'')Y fY b "'8]Y gY '\_ÒbbY b'  $\Rightarrow$  bY b'\Y'ZY b ž g]WX 'ni fY WX hni Z]b XY b'i bX'X]Y 'VY ghY b'5 b[ YV chY 'ni 'Z]b XY b.

- 2 DBJ '5dd.'l a 'X]Y 'VYghYb'JYfV]bXi b[Yb']b'9W\hnY]h'ni Yf\U`hYb"
- ; cc[`Y`A Udg.'⇒XYU`žia ']bhYfYggUbhY'CfhY'i bX
   FYghUi fUbhg'bU\Y'⇒fYg'GhUbXcfhg'ni 'Z]bXYb"
- 6]Y`YZY`X`Hcif]gaig.: Øf`U\_hiY``Y`JYfUbghU`hib[Ybž 9a dZY\`ib[Yb'ibX`GhUXhZØ\fib[Yb"

8 YhU]`g

6 Ygi WX Yb 'G]Y 'i bg 'Ui Z. 'Y]bY!fY]gY "XY